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The Evolution of Treatment Strategies in Internal Medicine: From Evidence to Practice

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Abstract
The change in the approaches to the management of Internal medical diseases has been greatly enhanced by evidence-based practice, personalized treatment, and technology. This review entailed a summary of the fundamental aspects of internal medicine about the historical backdrop of the specialty as well as the current advancements in the discipline. It describes the fundamentals and application of EBM, discusses the effects of the great clinical trials, and outlines all aspects of clinical guideline productions. Concerning genomic specializations, pharmacogenomics, and lifestyle adaptations are also looked at. Also, some aspects that require extra discussion are non-drug therapies, including behavioral treatments and new surgical procedures alongside innovative technologies, including telemedicine and artificial intelligence. The opportunity to translate the evidence is taken to analyze the difficulties that exist while implementing the evidence in practice, focusing on the disparities in healthcare and scarcity of resources. While anticipating the future of Internal Medicine, such strains as Regenerative Medicine and Precision health are discussed. Examples feature in the real contexts where EBP is used, and how utilization influenced the holistic health of patients. Hence, this review emphasizes more on the current need for internal medicine in enhancing patient care/health outcome, through consistent change/innovation.

Keywords: Evidence-based medicine, Personalized medicine, Clinical guidelines, Technological innovations, Treatment strategies.

1. Introduction

Internal medicine has developed immensely from crude and sometimes guesswork ways of treating illnesses to highly professionalized and;evidenced-based ways. There remains continuous progress in medical breakthroughs, the increase in available technology, as well as a constantly evolving knowledge of disease processes. EBM has played a major role in this evolution since it draws clinical decisions from the body of knowledge to improve patient outcomes and care quality. Therefore, this review seeks to explore the background, importance, and aims of the developments in approaching internal medicine treatments, to establish the latter's impact on today's practice.

1.1 Historical Overview

This paper aims to explore major highlights of the development of internal medicine as a branch of medicine to lay a foundation for current medical practices. During the initial stage of the twentieth century, the treatment offered for illnesses was mainly dependent on the perceived experience and conclusions drawn from them. The arrival of the scientific approach to structural research kick-started the development of clinical trials and systematic reviews. Arising from such crises, Archie Cochrane, who was the key to this transformation, advocated for an evaluation of the efficacy of medical procedures through cross-cut RCTs and systematic reviews.

It was the mid of the twentieth century that saw major innovations for example in the find of antibiotics. Penicillin, discovered by Alexander Fleming in 1929 is one of the most significant discoveries in medical history especially in the fight against bacterial infections, as it lowered mortality rates and shifted the methods of treating infectious diseases (Fleming, 1929). The last decades of the century marked the professionalization of EBM with early advocates such as David Sacket. It involves using evidence from clinical knowledge and acquaintance with patients' preferences with available research evidence as a guide to accelerating patient care (Sackett et al., 1996).

The advancement and popularisation of EBM can be regarded as the production of clinical guidelines and databases such as Cochrane Library which is a collection of systemically reviewed databases of primary research applying health care for human subjects and policy (Chalmers et al., 1989). These resources have gone a long way in sharing high-quality clinical evidence among clinicians to inform patient management.

2. Evidence-Based Medicine (EBM)

EBM may then be described as the process and the result that the information professional goes through and achieves when finding the evidence to address the clinical question.

EBM is also defined very sharply as the conscious and deliberate use of the best research evidence to inform decision-making specifically regarding patients. It combines scientific internal research data and the current external clinical evidence while it also assesses the patient's values and preferences(Cochrane et al.,1972). EBM has made some noteworthy assumptions that include:

Clinical Expertise: The training, and the practice that the clinician has to complete to obtain the respective skill and the ability in the sphere of clinical science.

Best Evidence: Such would be clinical investigative work that would be expected to come from medical or related discipline though will be from clinical research but originating from the patient.

Patient Values and Preferences: Elements like patients' gender, race, or other attributes of individuals who turn to a clinician for help cannot be excluded in practice.

2.1 Key Methodologies and Tools in EBM

Randomized Controlled Trials (RCTs): RCTs are rather believed to be the most powerful method in the assessment of the efficacy of the interventions. In RCTs participants are selected randomly, and are divided into two groups; the intervention group which receives the treatment that the study intends to test, and the control group which will receive a placebo or standard treatment. Randomizing in this manner eliminates every aspect for instance, the selection bias, and the researcher can compare the result from one group to the other without any guesswork (Schulz et al., 2010).

Meta-Analyses: Meta-analysis enables researchers to combine the results of several studies to obtain the most suitable estimate of the intervention or relationship. Multiple reviews that can be

derived from meta-syntaxes are less likely to have low statistical power than each corresponding individual study on its own and act to reduce the variability of outcomes across studies (Haidich 2010).

3. The Evolution of Treatment Strategies in Internal Medicine: Converting the Findings to Practice

3.1 Impact of Clinical Trials and Research

3.1.1 Defining Landmark Clinical Trials and Its Relationship to the Development of Treatment Protocols

High-profile clinical trials have provided a historical background to many current therapeutic paradigms in internal medicine. These trials offer the highest standard of proof, which informs physicians' choices and policymakers' decisions.

Framingham Heart Study: Started in 1948, the Framingham Heart Study is another major landmark in the study of the nature and risk factors for cardiovascular disease and has provided the basis for preventive measures and treatment methods for hypertension and hyperlipidemia (Dawber et al.,1951).

Randomized Controlled Trials (RCTs) of Antihypertensive Medications: The above-mentioned major RCTs like SHEP and HOT trials have helped in gathering the basic evidence for managing hypertension to revise the threshold and target estimates as proposed in the more recent guidelines(SHEP Cooperative Research Group, 1991; Kjeldsen et al., 1998).

The Diabetes Control and Complications Trial (DCCT): The rationale and significance of this trial was to prove the efficacy of intensive glucose control in Type 1 diabetes and after it; the guidelines for diabetes management were changed (Diabetes Control and Complications Trial. 1994).

The Women's Health Initiative (WHI): The WHI trial showed higher risks of HRT and the view on HRT in postmenopausal women changed (Rossouw et al., 2002).

3.1.2 Shifting of Research Findings into the Clinical Practice

Healthcare intervention is the process of applying knowledge derived from research studies to clinical practice, and the process can be divided into the development of guidelines, adoption of guidelines, and assessment of the guidelines' impact.

4. Development of Clinical Guidelines

4.1 Process of Guideline Development

The generation of clinical guidelines entails a set of procedures to guarantee recommendations that have been developed are right. This process generally includes several key stages: knowledge, which involves the steps of clinical questions identification, systematizing the checked information, writing recommendations, and external checks.

Identification of Clinical Questions: The process of establishing institution-specific guidelines is initiated by coming up with questions about what was done clinically. This involves the clinician, the researcher, and the consumer because as argued by Dowell,2022 the questions do help make the questions realistic and they indeed meet the client's needs.

Systematic Review of Evidence: Based on this, a few critical notes are provided for the existing literature on questions by the above-stated questions. This involves identifying and evaluating the relevant studies that could be meta-analyses, controlled trials, observational, or any other type of study (Guyatt et al., 1992).

Formulation of Recommendations: From the present findings one can note that systematic guidelines are planned. Recommendations can be classified depending on the level of available evidence about them and from the predicted gain/benefit to risk ratio suggested by Graham et al.,

2006. Although every measurement has its pros and cons, CERSI guidance notations may benefit practitioners with choice-making in scientific studies as a guideline.

External Review and Revision: They just enlist several rules, which are offered before other students and other stakeholders' meetings before these rules are enacted. This way, the guidelines formulated are not only realistic but also those that the majority of the players or stakeholders can adhenив to (Wang et al, 2018).

Table 1: Organizations Involved in Clinical Guideline Development

Organization	Area of Focus	Key Guidelines Published
World Health Organization (WHO)	Global health standards and guidelines	Guidelines for malaria treatment
Centers for Disease Control and Prevention (CDC)	Public health guidelines in the US	Guidelines for managing infectious diseases
National Institutes of Health (NIH)	Research and medical guidelines in the US	Guidelines for cancer treatment

4.2 Major Organizations Involved in Guideline Creation

Several prominent organizations are involved in the creation and dissemination of clinical guidelines: Numerous big associations are also formed to develop and distribute clinical guidelines:

World Health Organization (WHO): It is the biggest organization in the world that supports populations with various matters of health across the whole world. It is the global guidelines that are applied in the management of diseases and the provision of measures to eliminate epidemics to establish benchmarks (WHO, 2022).

Centers for Disease Control and Prevention (CDC): The Centers for Disease Control and Prevention has the responsibility of producing booklets most of which focus on the ills and diseases of the United States and those that are easily relayed to the public. Their guidelines also encompass almost all specialties of health care: infection prevention and chronic disease (Dowell,2022).

National Institutes of Health (NIH): NIH provides money for Medical research, resources in research of illnesses, and analyzed data to conduct research; it also helps in dispensing research data; and Infant, NIH contributes to shaping today's health care systems. They have stood in a position to act as one of the major players concerning the decision mechanism of standards in clinical practice concerning several fields (Rahaman, 2023).

4.3 Implementing guidelines in clinical practice: problems and discourses

Guideline implementation can face several challenges and controversies: The following are a few challenges encountered in the execution of guidelines and considerations of controversies;

Evidence Gaps: In some cases, the results are a direct product of guidelines development and can be acquired frequently from the published data irrespective of the quality of the evidence produced. This can result in a recommendation that may not cover all the clinical presentations adequately.

Conflicting Guidelines: These various entities are most probably going to design their policy about the same subject; this heralds confusion for the practitioners and hence; inadequate care is provided (Meyer et al., 2014).

Adaptation to Local Contexts: As much as these guidelines are formulated in one area they may not be implemented in other areas due to differences in the healthcare systems, resources, and the required healthcare services.

Resistance to Change: There is however a necessity to note that healthcare professionals can refuse to use new guidelines used in the provision of clinical services due to previous practices, perceived that new guidelines are irrelevant, or inevitable implementation barrier practices (Grimshaw et al., 2006).

Resource Constraints: The introduction of any guidelines means that there will always be additional necessary resource factors, time, training, and money that are not always treasury under-counter instruments in the various facilities of healthcare (Ogrinc et al., 2016).

5. Personalized Medicine and Genomics

5.1 Personalized Medicine

Precision medicine or personalized medicine is a system of medical approach in which diagnosis, treatment, and other medical interventions are delivered based on specific characteristics of the patient rather than the disease. The onset of individualized medicine can also be attributed to the developments in the field of genomics, as it has given a better insight into the action of genes, genetic differences, and their relation to health and disease as well as response to therapy (Collins & Varmus, 2015).

5.2 Genomics

Molecular medicine with its basic understanding of an organism's total genome, including all its genes, is one such area that has been transformed. The Human Genome Project which was called a 'completion' phase in 2003 focuses on the understanding of the molecular basis with various health disorders, whereby identification of genetic differences for diseases resulted (International Human Genome Sequencing Consortium, 2004). Genomic information can be utilized to determine an individual's susceptibility to diseases, as well as the existence and severity of ailments, this eventually enhances the development of patient-specific therapeutic solutions which leads to treatments with fewer side effects (Ashley, 2015).

Table 2: Examples of Personalized Treatment Approaches

Condition	Genetic Marker	Personalized Treatment	Outcome Improvement
Breast Cancer	HER2	Trastuzumab (Herceptin)	Increased survival rates (Swain et al., 2020)
Cystic Fibrosis	CFTR Gene Mutations	Ivacaftor	Improved lung function (Heneghan, 2022)
Melanoma	BRAF Mutation	Vemurafenib	Tumor reduction (Hauschild et al., 2020)

5.3 Sample Ethical & Legal Issues in Genetic Testing

5.3.1 Ethical Considerations

The following are some of the ethical issues that shall be associated with genetic testing; Privacy, Informed consent, and Discrimination. Individuals' genetic data should be protected to avoid

unfair treatment based on genetics in areas such as employment, and insurance, among others. Another important consideration is patients' understanding as they should know the consequences, advantages, and disadvantages of the genetic test (Rothstein, 2007). Furthermore, the area of concern on genetic discrimination led to the passage of laws such as the Genetic Information Nondiscrimination Act within the United States, which rules out discrimination in access to health insurance and employment on the grounds of genetic information (Hudson et al., 2008).

5.3.2 Legal Considerations

The rules that have been set under the current legal structure of genetic testing also contain provisions relating both to the reliability of the test and the legal status of the patient's genetic information as a form of personal property. Some government agencies have the responsibility of releasing and marketing genetic tests to protect the public against low validity and clinical utility through a process overseen by the U.S. Food and Drug Administration (Hamburg & Collins, 2010). Moreover, there are norms and legislations of genetic data ownership, use, and sharing, to seek to contain issues related to it (Caulfield et al., 2014).

6. Pharmacological Advances

6.1 Evolution of Pharmacotherapy

The therapeutic use of medications has undergone certain dramatic changes throughout several centuries. Historically, pharmacotherapy started with the use of natural products, specifically plants, minerals, and other things that were in existence even in the early civilization. The beginning of modern science has contributed to changing the methods of using drugs from empirical to more systematic-acute points of view.

At the onset of the 20th century, Fleming's discovery of penicillin producers became a reference point to the commencement of the antibiotic age (Fleming, 1929). This finding not only gave a potent weapon against bacterial infections but also paved the way for other classes of antibiotics thereby substantially diminishing the mortality and morbidity in infectious diseases (Lax, 2005).

The middle of the twentieth century saw the advent of disease-modifying drugs mainly for conditions like hypertension and diabetes. The introduction of beta blockers, alternate choice of calcium, and ACE inhibitors for instance made it possible to achieve targets in regulating blood pressure and avoiding cardio-vascular incidences (Frishman, 1987). Therefore, advancement in pharmacotherapy has been described by the shift from simple treatment where drugs used were aimed at correcting symptoms of diseases to modern pharmacotherapy that seeks to modify or halt certain physiological processes that are considered to have instigated the disease.

6.2 Start of New Drug Class and Treatment

The End of the 20th century up to the early 21st century has been characterized by new drug classes and new treatments. Further improvement in the treatment of hypercholesterolemia and cardiovascular risk was introduced with statins at the end of 1992. Statins function by slowing down the function of the HMG-CoA reductase enzyme that is involved in the synthesis of cholesterol hence leading to reduced LDL and enhancement of cardiovascular status (Goldstein & Brown, 2009).

Another major leap has been made in the direction of biologics, these are large molecules from living organisms. Some of these are monoclonal antibodies which have revolutionized the management of immune disorders and some forms of cancer (Mellman, Momin, and White, 2011).

For instance, the development of trastuzumab, a monoclonal antibody against HER2/NEU receptor over-expressed in breast cancer, has dramatically enhanced outcomes of patients suffering from this subtype of malignant neoplastic disease (Slamon et al., 2001).

Apart from biologics, small molecule inhibitors have proved effective in fighting cancer and showing their potential as important weapons. Molecules such as imatinib targeting the BCR-ABL oncoprotein in chronic myeloid leukemia, have made previously lethal malignancies into chronic illnesses (Druker et al., 2001).

6.3 Pharmacogenomics and Its Effect on Drug Treatment

Pharmacogenomics which is the branch of medicine that deals with how a person will respond to certain medicines has greatly influenced drug therapy. This field will be focused on developing ways to administer treatments and medicines depending on the patient's genetic makeup to maximize the therapeutic effect with minimal side effects (Roses, 2000).

One of the most recognizable examples of the pharmacogenomics application is the testing of HER2 in breast cancer cases. HER2-positive tumors are treatable with the help of targeted therapy with trastuzumab which enhances the outlook of the patients dramatically (Baselga et al., 1996). Likewise, the emergence of precise markers like EGFR and ALK in NSCLC has resulted in the use of molecules like erlotinib and crizotinib which proved to be much more effective than chemotherapeutic agents (Mok et al., 2009; Solomon et al., 2014).

It also implements pharmacogenomics in the management of typical sicknesses. For instance, different versions of the CYP2C19 gene determine how the drug clopidogrel which is used to prevent cardiovascular events is metabolized. It is shown and understood that patients with particular genes have to take other medications and approaches to receive the maximum benefit (Mega et al., 2009).

In addition, pharmacogenomics can become a branch that changes the existing state of psychiatry in the future. The identification of specific genes that are linked with psychiatric drugs could result in a better representation of patients who should be treated with certain medications in the future, and a decrease in the effectiveness of the 'hit or miss' method so common in psychiatry today because of the subjective nature of the problems in this sphere (Sullivan et al., 2012).

7. Non-Pharmacological Interventions in Internal Medicine

So far as the existing evidence is concerned, NPIs are the key components of the complex strategies for managing some internal medicine diseases. These are; diet/nutrition change, psychological/behavioral therapy, physical therapy and other treatments not classified as medicine/CAM. Thus, the NPIs are the related and additional treatments to the medications, while interacting in the process of shift in the patient's condition and improving the quality of his/her life.

Role of Lifestyle Modifications and Behavioral Therapies: Some NPIs have a part of their basic structure as a function of the change in lifestyle and the availability of behavioral therapies. These interventions are linked to sub-aspects of risk factors connected to chronic illnesses; they affect the long-term and even the lifetime trends toward healthy or unhealthy behaviors.

Diet and Nutrition: Diets are central in the control of such ailments as cardiovascular illnesses; diabetes, and obesity amongst other related diseases. Namely, the diet that has common characteristics with the Mediterranean region which implies a high intake of fruits and vegetables, whole grain products, and monounsaturated fatty acids has been assessed in connection with the recovery from cardiovascular diseases and the enhancement of the metabolic syndromes (Estruch et al., 2013).

Physical Activity: Random physical exercise is thus associated with better cardiovascular characteristics, glycemic control, and mental well-being. According to the guideline set by the American Heart Association, the set guideline for aerobic exercise is 150 minutes of moderate-intensity exercises or 75 minutes of vigorous-intensity ones per week (Piercy et al., 2018).
Behavioral Therapies: CBT and other PSYCH interventional procedures appropriate for the treatment of diseases including but not limited to depression, anxiety, chronic pain, and so on are mostly radical. According to Hofmann et al. (2012), CBT within chronic illness raises the time efficacy of chronic diseases by changing the negative ways of thinking and encouraging constructive behaviors.
Smoking Cessation: Smoking cessation programs including behavioral and drug therapy therefore are relevant in the decrease of cardiovascular and respiratory diseases. Long-term golfing erases the risk of heart disease, stroke, and cancer conspicuousness (Rigotti et al., 2012).
Stress Management: Meditational action, Mind Fullness, and Yogic practices are efficient to down-regulate the mind and with stress in the person. Some of the effects that have been noted regarding these practices include lowering hypertension, sustaining relative changes in pulse rates, and boosting mental well-being(Goyal et al., 2014).

7.1 Advancements in Surgical Techniques

Techniques in surgeries have gone through a major transformation in the recent past, Particularly, with the aim and intention to improve the overall results of surgeries done, the amount of time which is taken to recover from the surgery by the patients, Frequency of complications that are related to the surgical procedures.
Minimally Invasive Surgery (MIS): For example, laparoscopic and robotic-assisted surgeries are among the common techniques that have transformed most of the surgical specialties in MIS. These techniques have advantages in most parts as follows; there is minimal invasiveness and the size of the scar left behind is small, patients experience minimum pain and discomfort, patients can be discharged early from the hospital, and a short recovery period is required by patients (Bratzler et al., 2013; Kang et al., 2013).
Robotic Surgery: Robotic surgery technique has hence been applied in other operations to improve precision, reach, and steadiness of ineffective operations. Da Vinci Surgical System is generic in urology gynecology as well as general surgery as the paper proved that it has better results in several procedures (Moorthy et al., 2003).
Enhanced Recovery After Surgery (ERAS) Protocols: They are then described as system-wide and specific plans for delivering the patient's care in the context of the operation time frame. Techniques and precautions such as preoperative planning, proper pain control after surgery, early mobilization, and optimization of feeding pattern therefore are associated with less risks, and better outcomes (Kehlet & Wilmore, 2008; Ljungqvist et al., 2017).
Image-Guided Surgery: For example, intraoperative MRI and CT are some of the contemporary approaches to the improvement of the accuracy of surgery and the latter's safety. That is very useful in surgeries and the above techniques assist the surgeons to have such a view and working model of the interior structure(Schultz et al., 2011).

7.2 Integrative and Complementary Medicine

Another definition of complementary and integrative medicine may be defined as a form of the healing process that is offered together with modern medicine. The above are measures that are gradually being received and practiced as a positive intervention in the improvement of a patient's health status.

Acupuncture: Acupuncture is one of the ways of traditional Chinese medicine and it is the therapy of illnesses through the utilization of a slim needle. The present SR on RaBE has given evidence that RaBE reduces chronic pain, migraine, and osteoarthritis (Vickers et al., 2012; MacPherson et al., 2017).

Herbal Medicine: Some of these diseases include but are not limited to the following; The use of plants in the management of every disease that affects humankind is practiced in herbal medicine. Some of the herbs include; St-John's-Wort utilized in the treatment of depression and Ginkgo Biloba which is used in the enhancement of brain function and the use of the two has been seen to have a positive impact (Linde et al., 2008; Snitz et al.,2009).

Mind-Body Practices: For instance: Yoga, Tai chi, and Quigong will include besides that include; bodily postures and exercises, mind-body techniques, and breathing exercises. The following practices hasten mental health, and stress, besides improving the nutrient value of cycle three according to Cramer et al., (2013).

Nutritional Supplements: These include vitamins minerals and probiotics as they are perceived as supplementary foods whereby every organism of the body is a social need. For instance, omega-3 fatty acids are acknowledged to decrease inflammation and in this way improve atrial health (Harris et al.,2009).

Holistic Approaches: Integrative medicine focuses on the patient's health through applying a combination of medical treatments of his/her psychological, sociological, and spiritual aspects. This is because it establishes a healing interaction between the customer and the one in need of care hence exposing the givers to quality care and life (Maizes et al., 2009).

8. Technological Innovations in Treatment

8.1 Application of Digital Health Technology (for example Telemedicine, Wearables)

New technology, specifically through the application of digital health, has greatly transformed internal medicine positively by improving its availability, monitoring, and developing more appropriate care plans for patients. As an example, telemedicine has cropped up as a central enabler of connecting people with providers even in the era of COVID-19. In its applicability in the area of chronic disease care, telemedicine has proven effective for remote consultations and has the potential for general application in the reduction of medical expenditures. Smartwatches and fitness trackers have also become common with the utilization of physiological data; and checking of set vital signs, attempts, and sleep patterns that promote early identification of irregularities and consequent actions.

The use of telemedicine in daily practice has offered a positive outlook in the handling of changes like hypertension, diabetes, and heart failure. Research has shown that telehealth interventions are effective in reducing a patient's blood pressure and glycemic level. Wearable devices offer large amounts of data that can be used to standardize treatment protocols, check whether a patient takes his medication on time, and forecast possible health complications (Piwek et al., 2016).

8.2 Effect of Artificial Intelligence as well as Machine Learning

AI and ML are revolutionizing internal medicine through improving diagnosis, estimating patients' prognoses, and customizing treatments. Machine learning can learn from the vast amount of data available in the form of Electronic Health Records (EHR), images, and other genomic data and can perform analyses that are otherwise very difficult for a human being (Topol, 2019). For instance, in the diagnosis of diseases, ML models have been built to predict sepsis, a life-threatening disease,

with better accuracy compared to the traditional predictive models to name a few; this makes it easier for early interventions (Komorowski et al., 2018).

AI has also been applied in radiology where deep learning algorithms have attained exceptional accuracy in the interpretation of imaging studies for instance mammograms and CT scans, in some instances surpassing the human radiologist's performances (McKinney et al., 2020). Further, the use of predictive analytics in AI can help clinicians in risk assessment and general risk-solidated decision-making to enhance the patient's health status (Rajpurkar et al., 2017).

8.3 Forecasting Possibilities in the Medical Industry

It is therefore projected that the future of medical technology will be driven by the developments in the following fields; Genomics, Nanotechnology, and Robotics. Genomic medicine utilizing NGS as one of the key technologies is believed to be one of the significant tools in the development of personalized medicine that is based on the identification of mutations and subsequent adjustment of the treatment intervention strategy (Collins & Varmus, 2015). Thus, CRISPR-Cas9 technology in gene editing could mean the ability to correct imperfections in a child's genome and effectively treat inherited diseases (Doudna & Charpentier, 2014).

Some of the possibilities using nanotechnology include drug delivery where nanoparticles can be synthesized in such a way that they will only act on the affected cells and tissues and not the rest of the body (Wang et al., 2012). It is expected that robotics especially in surgical operations will improve accuracy, shorten the period of healing, and decrease the rate of surgical complications(Johansson et al., 2021)

Furthermore, applications of big data technology along with the Internet of Things (IoT) in the healthcare sector will facilitate better methods of data handling, real-time patient tracking, and anticipation that can lead to a preventive healthcare model (Raghupathi and Raghupathi 2014). In the integration of these technologies, general architecture to deliver a radically patient-centered healthcare system is laid and treatments as well as outcomes are progressively refined.

9. Challenges in Translating Evidence to Practice

9.1 Barriers to Implementation of Evidence-Based Practices

The implementation of evidence-based practices (EBPs) in clinical settings faces numerous challenges. These barriers can be categorized into several key areas

Knowledge and Awareness: Even in the cases Knowledge was described as incomplete and/or outdated, and Awareness was normally perceiving the gaps, mainly in EBGs. According to the established results, the importance of the further carrying out of continuous medical education was emphasized as the performing of the function of providing practitioners with information on current and future events(Cabana et al., 1999).

Attitudinal Barriers: The first and undoubtedly the most obvious one which is mainly reflected is the industrial relations issue, namely, the unwillingness of the HCWs towards changes. Grol and Grimshaw, 2003 for example, argue that clinicians for example always do what they have always done, rather than listen to some new effective procedures that are indicated in the literature.

Resource Constraints: Some of them include; defining what constitutes EBPs, inadequate time to search more about EBPs, staff, financial tutorials, or cash to purchase items about EBPs. For example, primary care may take a longer time to embrace the new practice than hospitals as posited (Bodenheimer & Pham, 2010).

Systemic Issues: Organizational and systemic barriers, such as lack of leadership support, inadequate infrastructure, and poor communication channels, also impede the adoption of EBPs (Greenhalgh et al., 2004).
Patient Factors: The following could be considered as the EBPs' limitations: the patient choice; the patient's voluntary behavior concerning the planned methodology performing the interventions; and culture integration. To manage such barriers, it is suggested that the interventions should be taken according to the needs of the patient as the patient enrollment in the study, should always be ongoing (Glasgow et al., 2006).

9.2 Issues Related to Healthcare Disparities and Access

Health care is also inequitatively distributed which is why research findings take time before it is implemented into practice this is because of a snag known as access. These disparities can be attributed to various factors:
Socioeconomic Status: Regarding this, I think that the population of the lower LCS socioeconomic class does not always have a right to health care, and their welfare is also always secured poorly in this aspect. This may thereby reduce the adventurous of EBPs to the disadvantaged of population.
Geographic Barriers: the restriction of distance and cost are some of the challenges that resonated with the hearts of the people about the rural or remote health care facility or the accessibility of health care services; specialty services and especially the specialty treatments are less accessible. Mobile health clinics as well as the communicating health care services such as those which entail the use of telemedicine are addressing this lack (Douthit et al. 2015).
Racial and Ethnic Disparities: discrimination especially based on racial background has not been eliminated since employment discrimination is still a major issue affecting the fate of the minority group. Hence, it could be suggested that something like intervention, for instance, the improvement and provision for cultural competency of the practitioners in the health sector together with other activities such as closely related activities like community-based interventions could assist a lot in combating the aforementioned disparities(Smedley et al.,2003).
Insurance Coverage: Thus, the main factors that allow directly indicating why patients do not search for and/or do not obtain adequate treatment include the absence of health insurance or inadequate health insurance. It shows that coverage can be improved; therefore, such can be prevented by policy interventions.

10. Future Directions in Internal Medicine

10.1 Emerging Trends and Innovations

Internal medicine is continually evolving, with several emerging trends and innovations shaping its future: First of all, one must not consider internal medicine as an astatic subject of study or discipline since it indeed has a dynamic nature that is not entirely concealed behind its dynamics The internal medicine's future is being shaped by various trends and innovations which are in the process of being constructed as follows:
Precision Medicine: Corrective methods that allow for the description of the DNA matter that defines the concept of a genotyped profile belong to the field of personalized medicine where the treatment regimen is a match to the patient's DNA. Ashely established that the approach has had potential evidence in oncology and other fields in the year 2015.
Digital Health Technologies: Teleconsultation; venturing into mobile health applications, wearables and other smart objects are one of the new phenomena adopted during handling patients. As Kvedar and his associates claimed, these technologies improve the synchronous and asynchronous supervision of patients and the engagement, also, the accumulation of data (Kvedar et al., 2014).

Artificial Intelligence (AI) and Machine Learning (ML):: The field of AI specifically Machine Learning is being used in prognosis, diagnostics, and for the suggestion of therapeutic measures more and more. These technologies may therefore assist in rediscovering internal medicine as Jiang and his team have pointed out.
Regenerative Medicine: Stem cells and tissue engineering, the icon of today and tomorrow of regenerative medicine has provided this human disease treatment with a foundation that would have probably treatments for heart diseases as well as neurodegenerative disorders among others(Mason & Dunnill, 2008).

10.2 Future Treatment Plan Prognostications

Future treatment strategies in internal medicine are likely to be influenced by several key factors: Many trends and developments analyzed to give an idea about the future encounters of internal medicine as follows:
Integration of Big Data: According to the representation made in this paper, the capacities of the doctor handling big data oncology will also rise, boosting the attempts of attempting to individualize treatments to provide superior results that can be derived from large health data sets. Hence, this approach can be explained to have better outcomes and lower the active care cost (Murdoch &Detsky, 2013).

Value-Based Care: Comments regarding the orientation on guiding principles of value-based care systems that are designed to enhance the fate and cost value of a natural patient announce the organization and call for based evidence and high-value medical treatments (Porter, 2010).
Holistic and Integrative Approaches: Nonetheless, the total profiles of health will still increase in concern with the human being-oriented approaches that will embrace the medical, psychological, and social characteristics of health. This trend is already inherent in the rise in the rating of the integrative medicine practices that Snyderman and Weil (2002) pointed out.

10.3 The Present Research and Possible Stakes and Areas for Further Investigation

Several areas in internal medicine require ongoing research and further exploration: Some subdivisions of internal medicine are still waiting for further research and either continuous or new investigation.

Chronic Disease Management: Interventions to such community health chronic diseases instance diabetes and cardiovascular diseases for instance are requisite. In its details, the management should understand that more research into prevention measures such as lifestyle changes and other new approaches to handling the condition are in order.
Health Disparities: In this sense, it can be stated that the objective of the relevant policies to reduce health inequalities objectively has not been let go of. Research should explore the root causes of disparities and develop targeted interventions to improve access and outcomes for underserved populations (Artiga & Hinton, 2018).

Antimicrobial Resistance: This truth Daly proves that an increase in the number of resistance towards antibiotics is a clear threat that is posed to global health. More research on new antibiotic production and other friendly treatments is still deemed necessary to be in a good position to attend to the existing infections that are resistant (Ventola, 2015).
Mental Health Integration: Mental health should be conducted as a part of primary care as it is a component of the overall health of a patient. Thus, it is needed to concentrate on further research

on the perspective of integration as well as on the perspective treatments of various kinds of mental disorders in general (Butler et al., 2008).

11. Case Studies and Real-world Applications

11.1 Examples of Successful Implementation of Evidence-Based Practices

Heart Failure Management: Specific guidelines on the management of heart failure present by various stakeholders like the ACC, and AHA among others have contributed to the enhanced handling of the conditions with better outcomes. Research has pointed out that following of these guidelines leads to decreased readmission and death rates (Fonarow et al., 2017; Yancy et al., 2017).

Antibiotic Stewardship Programs: Antibiotic stewardship programs (ASPs) are developed and aimed at the rational usage of antibiotics and prevention of antibiotic resistance. ASPs that have been successfully introduced to the management of different healthcare facilities have been reported to reduce the usage of antibiotics and healthcare-associated infections (Dellit et al., 2007; Barlam et al., 2016). For instance, in a systematic review by Barlam et al., (2016), it was noted that ASPs could effectively reduce the rate of *Clostridium difficile* infections by 26 percent.

Diabetes Management: Several reports have recommended that diabetes guidelines like the ADA popularised have the potential to enhance glycemic control and reduce complications. For instance, following the adoption of extensive DM care programs in primary healthcare facilities, patients have experienced an improvement in HbA1c and fewer cardiovascular complications incidents (Ali et al., 2013; American Diabetes Association, 2018).

Table 3: Case Studies of Evidence-Based Practices

Case Study	Condition	Intervention Implemented	Outcome
Heart Failure Management	Chronic heart failure	Use of ACE inhibitors	Reduced hospital readmissions (Bhatt et al., 2021)
Diabetes Care	Type 2 diabetes	Lifestyle intervention programs	Improved glycemic control (Johansson et al., 2023)
Cancer Treatment	Non-small cell lung cancer	Immunotherapy	Increased survival rates (Reck et al., 2016)

11.2 Impact on Patient Outcomes and Healthcare Systems

Improved Patient Outcomes: It has been established that the enhancement of EBP affects the quality of the patient's condition in different medical diseases. For instance, the effective management of heart failure has seen decreased mortality and hospitalization incidences as established by O'Brien et al., (2015). To the same extent, the implementation of the national treatment guideline has led to improved glycemic control and reduced the complications of diabetes that include (Ali et al., 2013).

Cost-Effectiveness: It is also, important to note that the efficiency of successfully well-tested and researched EBPs results in decreased health, costs, and utilization, due to precaution of avoidable procedures and hospitalizations. For instance, ASPs have been documented to reduce health costs

through better utilization of antibiotics and reducing infections this being a costly affair (Dellit et al., 2007; Barlam et al., 2016).

Enhanced Healthcare System Efficiency: The implementation of EBP can bring the enhancement of the systems' general effectiveness of healthcare facilities. Thus, through increasing the control and decreasing the variation, evidence-based practices help to deliver consistent and high-quality patient care. This standardization also enables critics and the development of healthcare services (Grol& Grimshaw, 2003, Institute of Medicine, 2001).

12. Conclusion

Internal medicine practice has gone through a major evolution because of the application of; evidence-based medicine, patient-centered care, and technology. All these components have been identified to play central roles in defining the conventional treatment programs of today. The concept of EBM has been quite helpful in offering a strong structure for decision-making in clinical practice to increase the quality and applicability of the interventions offered to patients. Modernized medical treatments seem to be more individualized, which is influenced by the patient's genetic information and other characteristics. Telemedicine and the use of artificial intelligence have gone further in changing the way patients are managed and health care delivered. Nevertheless, some issues remain in today's society, such as compliance with the best practices, health and health care disparities, and fair distribution of the newest treatment modalities. There are great expectations for future developments in internal medicine, especially for regenerative medicine and precision health which adds more positive impacts on the patient. Living on the change is the only way of eradicating the existing barriers and the system for improving excellence in the provision of patient services. With the development of new advancements in internal medicine, upholding this pledge to apply evidence, individuality, and technologies will be vital in responding to the changing patients' and global healthcare systems' clients.

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